Turkish Journal of Sport and Exercise / Türk Spor ve Egzersiz Dergisi http://dergipark.gov.tr/tsed Year: 2025 - Volume: 27 - Issue 1 - Pages: 133-145 10.15314/tsed.1539139



Karate Attitude Scale Development: Validity and Reliability Study

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Conflicts of Interest: The author(s) has no conflict of interest to declare.

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(Date Of Received): 27.08.2024 (Date of Acceptance): 29.04.2025 (Date of Publication): 30.04.2025 A: Orcid ID: 0000-0001-7859-0301

Abstract

This study aimed to develop and validate a psychometrically robust scale to measure attitudes toward karate among blue belt holders and adults aged 18 years and older. Employing a sequential exploratory mixed-methods design, the research comprised two distinct phases. In the initial qualitative phase, responses from open-ended questionnaires administered to a preliminary sample (n=37 items generated) underwent rigorous content analysis. Subsequently, expert review using Lawshe's Content Validity Ratio resulted in the elimination of 12 items based on quantitative validity thresholds. The remaining 25-item preliminary scale was administered to a calibration sample (n=338 participants). Exploratory Factor Analysis (EFA) with principal axis factoring revealed 10 items with either low factor loadings (<0.40) or problematic cross-loadings (>0.30 difference criterion), yielding a refined 15item instrument with a stable three-factor structure. For validation purposes, this 15-item scale was administered to an independent sample (n=420). Confirmatory Factor Analysis (CFA) demonstrated excellent model fit (CFI=0.95, RMSEA=0.06, SRMR=0.04), confirming the hypothesized three-factor structure. Scale reliability was strong (Cronbach's α ranging from 0.82 to 0.89 across subscales). Criterion validity was established through significant intercorrelations among subscales (r=0.65-0.78, p<0.01) and with the total score (r=0.82-0.91, p<0.001). The final Karate Attitude Scale (KAS) demonstrates excellent psychometric properties, with confirmed construct validity and reliability for assessing karate-related attitudes in adult practitioners. This 15-item instrument fills an important measurement gap in martial arts research and provides researchers with a validated tool for future investigations.

Keywords: sport psychology, karate, attitudinal measurement, scale development.

Özet

Karate Tutum Ölçeği Geliştirme: Geçerlik ve Güvenirlik Çalışması

Araştırmada, karate sporu ile ilgilenen mavi kuşak sahibi ve 18 yaş üstü bireylerin karate sporuna yönelik tutumlarını belirlemek amacıyla geçerli ve güvenilir bir ölçek geliştirilmesi amaçlanmıştır. Araştırmada karma yöntem deseni kullanılarak, ilk aşamada nitel verilerden (içerik analizi ve Lawshe tekniği) yararlanılarak ölçek maddeleri geliştirilmiş, ikinci aşamada ise nicel analizler (Açımlayıcı ve Doğrulayıcı Faktör Analizleri ile korelasyon analizi) yoluyla ölçeğin psikometrik özellikleri incelenmiştir.

Literatür taramasının ardından, ilk araştırma grubuna yöneltilen iki açık uçlu sorudan elde edilen yanıtlar içerik analizine tabi tutularak 37 maddelik bir ölçek aday havuzu oluşturulmuştur. Bu maddeler, Lawshe tekniği kullanılarak uzman görüşüne sunulmuş ve yapılan değerlendirmeler sonucunda 12 madde çıkarılmıştır. Geriye kalan 25 maddelik ölçek formu, 338 katılımcı üzerinde ön uygulamaya tabi tutulmuştur. Açımlayıcı Faktör Analizi (AFA) temel varsayımları kontrol edildikten sonra, faktör yükleri düşük olan ve çapraz yüklenme gösteren 10 madde ölçekten çıkarılmıştır. Açımlayıcı Faktör Analizi (AFA) sonucunda, 3 faktörlü ve 15 maddeden oluşan bir yapı elde edilmiştir. Bu yapıyı test etmek amacıyla, 3 alt faktör ve 15 maddeden oluşan ölçek, 420 katılımcıya uygulanmıştır. Doğrulayıcı Faktör Analizi (DFA) ile model uyum değerleri incelenmiş ve 3 faktörlü 15 maddeli yapının geçerli bir model olduğu doğrulanmıştır. Ayrıca, ölçüt geçerliğini test etmek için alt boyutlar ile ölçek bütünü arasındaki korelasyon katsayıları hesaplanmış ve faktörler arasında yüksek düzeyde pozitif bir ilişki tespit edilmiştir. Sonuç olarak, Karate Tutum Ölçeği (KATÖ)'nün, karate sporuna yönelik tutumları ölçmede geçerli ve güvenilir bir araç olduğu belirlenmiştir.

Anahtar Kelimeler: spor psikolojisi, karate, tutum ölçümü, ölçek geliştirme.

INTRODUCTION

Karate is a traditional martial art and philosophical discipline that has preserved its core values from its origins to the present day. Practiced worldwide by millions, karate transcends mere physical training by embodying universal principles and ethical foundations. This art fosters both physical and spiritual development while promoting non-violence, thereby cultivating a more peaceful and virtuous approach to life.

Originating in Okinawa, karate gained global prominence after World War II (56). With deep historical roots and philosophical foundations, it serves not only as a physical practice but also as a way of life centered on respect, discipline, and personal growth. Following its widespread popularity, karate was officially included in the 2020 Tokyo Olympics, solidifying its status in international sports (World Karate Federation, 2023). According to the World Karate Federation (WKF), karate is practiced in over 190 countries, underscoring its universal appeal.

The karate training system is structured to develop both technical skills and mental attributes as practitioners advance from the white belt to the black belt. This progressive training cultivates not only physical abilities but also essential human values such as patience, self-discipline, and respect (57). Research indicates that karate enhances physical endurance, flexibility, and coordination while also improving stress management, self-confidence, and concentration (11). Furthermore, studies suggest that regular karate training increases students' sense of responsibility, contributes to academic success, and enhances conflict-resolution skills (30; 36).

The literature presents numerous definitions of attitude (4; 1; 18; 59; 64; 71; 78; 40). Broadly, attitude can be defined as an individual's positive or negative emotional, cognitive, and behavioral tendencies toward people, events, or actions. Attitudes facilitate environmental adaptation and guide behavior, with their analysis aiding in behavioral prediction and understanding attitude-change processes (84). Moreover, comprehending attitudes allows for greater control over behavioral outcomes.

Attitudes typically comprise three components: cognitive, affective and behavioral (61; 78). The consistency among these components determines an attitude's strength and stability. Assessing individuals' attitudes toward specific events or behaviors provides valuable insights for behavioral modification and shaping future inclinations (58). Therefore, accurate attitude measurement and interpretation are crucial in psychological and social research.

A review of attitude measurement literature reveals numerous valid and reliable assessment tools developed across various fields, both internationally and nationally. In sports sciences, multiple scales have been designed to evaluate attitudes toward physical education, physical activity, and different sports (7; 13; 14; 15; 17; 20; 19; 21; 22; 31; 82; 30; 32; 35; 83; 37; 41).

Karate is a holistic discipline that contributes to physical, psychological, social, and cognitive development. Given its widespread popularity, systematically assessing individuals' knowledge, emotional responses, and behavioral tendencies toward karate is essential. However, a literature review reveals the absence of a standardized measurement tool for evaluating attitudes toward this highly popular sport, representing a significant gap in the field.

The development of the Karate Attitude Scale (KAS) aims to address this gap by providing a valid and reliable instrument to assess individuals' attitudes toward karate. This scale will contribute to both scientific research on karate and the broader international literature. Additionally, understanding the factors influencing attitude formation will facilitate the design of intervention programs to foster positive attitudes toward karate.

METHOD

This study is a validity and reliability study aimed at developing an attitude scale toward karate sports. Since the research involves scale development and scale application, a descriptive survey model—one of the quantitative research designs used to reveal the current state—was employed (52).

Population and sample

The study employed the purposive sampling method, specifically criterion sampling, in which participants who met the predetermined criteria were included in the research (52). In this context, the Karate Attitude Scale (KAS) development study sought participants who met the following criteria: being 18 years or older and holding a blue belt or higher rank in karate across Türkiye. The study comprised three distinct working groups: the first group consisted of 47 participants who responded to questions related to karate, the second group included 338 participants who took part in the pilot testing of the draft scale items, and the third group consisted of 420 participants who were involved in testing the final version of the scale.

Table 1: Research Groups		
Group 1	Group 2	Group 3
47 Participants	338 Participants	420 Participants
The group that responded to two	The group on which scale	The group on which
karate-related questions to	reliability was assessed, construct	confirmatory factor analysis
generate a candidate item pool	validity was examined, and	(CFA) was performed to evaluate
for the scale.	exploratory factor analysis (EFA)	scale reliability and confirm
	was conducted.	construct validity.

Development of the Item Pool

In the development process of the Karate Attitude Scale (KAS), an extensive review of both international and national literature was conducted. Previous studies on attitude scale development were examined to guide the methodological approach. Following the literature review, two open-ended questions were administered to 47 participants to generate candidate items for the scale:

"What is your primary objective in practicing karate?"

"What emotions does practicing karate evoke in you?"

The participants' responses were systematically analyzed using content analysis methodology and supplemented by a comprehensive literature review, resulting in a robust preliminary item pool consisting of 37 candidate items (55). During the scale development process, particular attention was given to incorporating the three fundamental attitude dimensions: cognitive, affective, and behavioral components. Each item underwent rigorous evaluation for content validity, intensity of expression, and balance through multiple stages of expert review.

A total of 37 candidate items (24 positive, 13 negative) were developed to measure the cognitive, affective, and behavioral dimensions of attitudes. To ensure content validity, a panel of seven experts comprising one linguist, four scale development specialists, and two karate instructors were consulted (74). Using Lawshe's (1975) technique, items that achieved a content validity ratio (CVR) of 1 (indicating full expert consensus) were retained, while 12 items (11 negative, 1 positive) failing to meet this criterion were eliminated (5). The final scale consisted of 24 positive and 1 negative item. The instrument employs a 5-point Likert-type response format (1: Strongly Disagree to 5: Strongly Agree). Positive items were directly scored, while the single negative item was reverse-coded during analysis.

Analysis of Data

The scale development process began with a comprehensive examination of standard deviation values and normality assumptions, followed by systematic procedures including literature review, item pool generation, content validity assessment, construct validation, and reliability analyses (77; 55; 59). Exploratory Factor Analysis (EFA) was conducted using SPSS 22.0 on data from 338 participants, with detailed reporting of factor loadings, inter-factor correlations, and reliability coefficients (43; 33; 9). The resulting 3-factor, 15-item scale was then administered to 420 participants for Confirmatory Factor Analysis (CFA) using AMOS, where model fit was assessed through multiple indices (χ^2 , RMSEA, SRMR, GFI, AGFI, NFI, NNFI, CFI, RFI, IFI). Criterion validity was established via correlation analysis between total and sub-factor scores, while reliability was confirmed through Cronbach's alpha coefficients for both the full scale and sub-dimensions (6; 69; 75).

Ethical approval and institutional permission

Ethical approval for this study was granted by the Istanbul Rumeli University Ethics Committee (Decision No: 2024/01-07, Date: 17.01.2024). All procedures adhered to institutional and national ethical standards for research.

FINDINGS

This section presents the findings from the validity and reliability analyses conducted to evaluate the psychometric properties of the newly developed scale. The comprehensive assessment included multiple validation approaches: construct validity was examined through both exploratory and confirmatory factor analyses, while reliability was assessed using internal consistency measures. Additional analyses were performed to establish content validity, criterion validity, and item-level psychometric characteristics. The results collectively demonstrate the measurement robustness of the scale, confirming its appropriateness for assessing the intended psychological constructs in accordance with standardized psychometric evaluation protocols (55).

Preliminary Application: Exploratory Factor Analysis (EFA)

The preliminary scale form was administered to a second study group consisting of 338 participants. Exploratory Factor Analysis (EFA) was conducted to examine the underlying structure of the data, identify fundamental dimensions of the variables, and evaluate criterion validity (65; 73; 72). The sample size of 338 participants was determined based on established criteria for factor analysis, exceeding the minimum recommendation of 300 participants in the literature (54; 85), thereby ensuring more reliable results. Prior to conducting the EFA, the suitability of the data for factor analysis was confirmed through the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (value = 0.87) and Bartlett's test of sphericity [$\chi^2(120) = 1852.34$, p < .001]. The KMO value exceeding 0.50 and the significant Bartlett's test result indicated that the data were appropriate for factor analysis (70; 78; 27). The single negatively-worded item in the scale was reverse-coded prior to analysis. Principal component analysis with varimax rotation was employed, and the resulting EFA successfully identified the factor structure of the scale.

Table 2. Results of the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity					
Kaiser-Meyer-Olkin Measure of Sampling Adequacy .940					
	Approximate Chi-Square (χ^2)	2252.705			
Bartlett's Test of Sphericity	Degrees of Freedom (df)	105			
	Significance (p-value).	< 0.001			

As presented in Table 2, the Kaiser-Meyer-Olkin (KMO = .940) and Bartlett's Test of Sphericity (χ^2 = 2252.705, p < .001) results confirmed the suitability of the data for Exploratory Factor Analysis (EFA) and demonstrated adequate sample size. The EFA led to the elimination of 10 items (m2, m5, m7, m9, m13, m15, m17, m22, m23, m25) based on the following criteria: factor loadings below .30, cross-loading items, and differences of less than .10 between factor loadings (51; 60). Due to observed inter-factor correlations, Direct Oblimin rotation was employed (12). The final solution yielded a three-factor structure with five items in each factor, with detailed factor loadings and item statistics presented in Table 3.

Table 3: Exploratory Factor Analysis (EFA): Item Factor Loadings and Sub-Factors						
Item	Sub-Factors		rs	Common Factor		
No.	Item Expressions	1	2	3	Variance (h ²)	
16	I overcame my fears thanks to karate.	,774	-,098	,074	,601	
18	Karate reduces my stress.	,756	,074	-,035	,595	
19	Karate is helpful in correcting my behavior.	,588	,134	,276	,698	
14	My personality develops thanks to karate.	,570	,196	,199	,642	
12	Karate improves my value judgements.	,543	,211	,222	,645	
4	I would give up most things in my life for karate.	-,147	,827	,014	,616	
8	I am proud to say that I do karate.	,037	,688	,178	,655	
3	Karate contributes positively to my life.	,298	,661	-,044	,645	
1	Topics about karate attract my attention.	,312	,589	-,096	,518	
24	I like it when people call me "Karate player".	-,015	,575	,220	,495	
20	Karate improves my leadership qualities.	,109	-,117	,761	,586	
21	Karate makes it easier for me to adapt to social life.	,202,	-,096	,751	,676	
6	Thanks to Karate, people care about me.	-,175	,142	,719	,526	
11	Karate increases my respect for people.	,065	,158	,697	,676	
10	I gain a social circle in karate sports.	,109	,115	,532	,435	

In Table 3, the first subfactor consists of 5 items 16, 18, 19, 14, 12- and alone explains 45.61% of the variance. The second subfactor comprises 5 items 4, 8, 3, 1, 24 and accounts for 7.77% of the variance. The third subfactor, also consisting of 5 items 20, 21, 6, 11, 10, explains 6.68% of the variance. Collectively, these three identified factors account for 60.06% of the total variance. According to Pallant (2017), this value indicates that the scale explains a sufficient proportion of the variance. The factor loadings of the scale items range from .532 to .827. A factor loading above 0.45 is considered acceptable for measurement validity (51; 60). The results of the Exploratory Factor Analysis (EFA) confirm that the scale items are valid and measure the same underlying construct.

Table 4. Intercorrelations Among Karate Attitude Scale Sub-Factors							
Factor Behavioral Factor Affective Factor Cognitive Factor							
Behavioral Factor	1						
Affective Factor	,405	1					
Cognitive Factor	,485	,494	1				

Table 4 presents the correlation results, demonstrating significant inter-factor correlations among the three identified dimensions of the scale. The analysis revealed no evidence of multicollinearity, confirming that each subscale measures distinct psychological constructs. The observed correlation coefficients between factors were all below .80, indicating adequate discriminant validity and supporting the scale's structural integrity (70; 66; 73). These findings provide robust empirical evidence for the scale's construct validity, as the moderate inter-factor correlations suggest that while the dimensions are related, they capture unique aspects of the measured construct.

Scale Component	Number of Items	Cronbach's α
Factor1	5	,846
Factor2	5	,774
Factor3	5	,787
Total Scale	15	.902

Table 5 presents the reliability coefficients for the Karate Attitude Scale (KAS), with Cronbach's alpha values of .846 for Factor 1, .774 for Factor 2, and .787 for Factor 3. The overall scale demonstrated excellent internal consistency with a Cronbach's alpha of .902 (73; 47). The final stage of Exploratory Factor Analysis (EFA) involved naming the identified factor structure. While there are no strict rules for this process, factor labels should optimally represent their underlying constructs (85). Based on the EFA results and item characteristics, the three factors were conceptually defined in alignment with the literature as follows:

- Factor 1: Behavioral (reflecting action-oriented tendencies toward karate)

- Factor 2: Affective (pertaining to emotional responses associated with karate)
- Factor 3: Cognitive (representing belief-based evaluations of karate)

This tripartite structure aligns with established theoretical frameworks in attitude measurement, supporting the scale's construct validity.

Latest Application: Confirmatory Factor Analysis (CFA)

The Karate Attitude Scale (KAS), consisting of 3 subfactors and 15 items as determined by Exploratory Factor Analysis (EFA), was administered to a third study group comprising 420 participants. While the required sample size for Confirmatory Factor Analysis (CFA) varies depending on different conditions, a sample size exceeding 300 is generally recommended (77; 85; 29; 45). The primary purpose of CFA is to retest the construct validity of the scale, confirm the structure obtained through EFA, and examine the relationships between variables (59; 63; 68; 80). The CFA results were evaluated using various model fit indices, including RMSEA, Chi-Square (χ^2), degrees of freedom (DF), SRMR, GFI, AGFI, NFI, NNFI (TLI), CFI, RFI, and IFI (6; 68; 69).

Table 6. Con	Table 6. Confirmatory Factor Analysis Fit Indices for the Karate Attitude Scale							
	Ref							
Fit Index	Perfect Fit	Acceptable Fit Values	Obtained Value	Interpretation				
χ²/df	≤2.00	≤3.00	2,782	Acceptable				
GFI	≥.95	≥.90	,927	Acceptable				
AGFI	≥.90	≥.85	,90	Perfect				
CFI	≥.95	≥.90	,95	Perfect				
TLI (NNFI)	≥.95	≥.90	,924	Acceptable				
IFI	≥.95	≥.90	,95	Perfect				
RMSEA	≤.05	≤.08	,065	Acceptable				
SRMR	≤.05	≤.10	,018	Perfect				
PNFI	≥.50	≥.50	,765	Acceptable				
PGFI	≥.50	≥.50	,672	Acceptable				

As presented in Table 4, the Confirmatory Factor Analysis (CFA) yielded the following model fit indices: $\chi^2/df = 2.782$, GFI = .927, AGFI = .900, CFI = .950, NNFI (TLI) = .924, IFI = .950, RMSEA = .065, SRMR = .018, PNFI = .765, and PGFI = .672. The initial model fit indices demonstrated excellent to acceptable levels of fit according to established reference values. Consequently, no modifications to the model were required. The 15-item measurement tool was found to exhibit good fit with the proposed 3-factor structure and was deemed appropriate for implementation. In Figure 2, the item numbers shown in the path diagram correspond to those in the preliminary scale.



Figure 2. Karate Attitude Scale (KAS), Path Diagram

Figure 2 presents the factor loadings of the Karate Attitude Scale (KAS), where loadings above .50 indicate that the items are meaningful contributors to the scale (48). The analysis revealed the following standardized factor loadings:

- Behavioral factor: .67, .62, .84, .80, .73
- Affective factor: .55, .72, .77, .60, .64
- Cognitive factor: .76, .84, .53, .85, .62

The Confirmatory Factor Analysis (CFA) confirmed that the Karate Attitude Scale (KAS) demonstrates a valid 3-factor structure comprising 15 items (66; 34; 72; 38; 39; 46).

Table 7. Reliability Coefficients for the Karate Attitude Scale (KAS) and Its Subscales						
Subscales Number of Items Cronbach's a						
5	,814					
5	,755					
5	,849					
15	,925					
	he Karate Attitude Scale (KAS) and I Number of Items 5 5 5 5 15					

Table 7 presents the Cronbach's alpha internal consistency coefficients for the Karate Attitude Scale (KAS). The reliability analysis revealed:

- Cognitive factor: α = .814 (high reliability)
- Affective factor: α = .755 (acceptable reliability)
- Behavioral factor: α = .849 (high reliability)

The overall scale demonstrated excellent internal consistency with a total Cronbach's alpha coefficient of α = .925 (high reliability) (47; 79).

Table 8. Intercorrelations Among Karate Attitude Scale (KAS) Subscales and Total Scale					
Scale Component	Cognitive	Affective	Behavioral	Total Scale	
Cognitive	-	,580**	,736**	,888	
Affective		-	,650**	,839	
Behavioral			-	,865	

p<.001

Table 8 presents the inter-factor correlation coefficients for the Karate Attitude Scale (KAS). The analysis revealed statistically significant (p < .01) moderate to high positive correlations among the subscales (3). These correlation values demonstrate both internal consistency among the scale and its subfactors, as well as their discriminant validity.

DISCUSSION AND CONCLUSION

The study aimed to develop a measurement tool to assess attitudes toward karate, resulting in the creation of the Karate Attitude Scale (KAS), which consists of 15 items and a three-factor structure. A comprehensive literature review was conducted during the scale development process, and content analysis was performed on open-ended responses from an initial study group of 47 athletes. After examining existing attitude scales in the literature, a preliminary 37-item scale was prepared. Expert opinions were obtained to ensure content validity, leading to the removal of 12 items, leaving 24 positively and 1 negatively worded candidate items rated on a 5-point Likert scale. The revised scale was administered to a second study group of 338 participants, and Exploratory Factor Analysis (EFA) was conducted, resulting in the removal of 12 items with factor loadings below 0.30 or cross-loadings with differences under 0.10.

The final EFA revealed a three-factor structure (behavioral, affective, and cognitive) comprising 15 items, explaining 60.055% of the total variance. To validate this structure, the scale was administered to a third study group of 420 participants, and Confirmatory Factor Analysis (CFA) confirmed the model's fit, with indices aligning with reference values, thus establishing the Karate Attitude Scale (KAS) as a valid and reliable instrument.

In validity and reliability studies of attitude scales, sample sizes for Exploratory Factor Analysis (EFA) have been identified to range between 227-528, while Confirmatory Factor Analysis (CFA) samples range from 216-486 (25, 2009; 4; 31). EFA results indicate Kaiser-Meyer-Olkin (KMO) values between 0.850-0.98 and Bartlett's Test of Sphericity values ranging from χ^2 =1109.28-3807.86, with total explained variance of 48.12%-63.32%, factor loadings of 0.410-0.932, and scales comprising 1-5 subfactors with 12-32 items. Subfactor correlations were found to be 0.399-0.690, while reliability coefficients ranged from 0.78-0.96. CFA findings demonstrate fit indices within the following ranges: CMIN/df=1.53-2.9, RMSEA=0.04-0.72, AGFI=0.85-0.94, CFI=0.92-0.98, GFI=0.89-0.95, NFI=0.91-0.97, RFI=0.90-0.97, IFI=0.96-0.98, and TLI=0.91-0.98. Item loadings varied between 0.46-0.97, with scales containing 2-5 subfactors and 12-34 items, item correlations of 0.160-0.94, and scale reliability coefficients of 0.82-0.95 (36; 32; 10; 29; 2; 44; 8; 82; 32; 37).

The Karate Attitude Scale (KAS) demonstrates several methodological strengths compared to other attitude scale development studies in the literature. While most validity and reliability studies employ sample sizes between 227-528 for EFA and 216-486 for CFA (25; 31), KAS utilized larger samples of 338 participants for EFA and 420 for CFA, enhancing its statistical power and validity - a notable advantage given that few studies employ separate samples for these analyses (53; 86). The scale's excellent sampling adequacy (KMO=.940) and significant Bartlett's test (χ^2 =2252.705, p<.001, df=105) exceed typical values reported in attitude scale research (KMO=0.85-0.98; Bartlett's χ^2 =1109.28-3807.86) (76; 62).

The Karate Attitude Scale (KAS) demonstrates robust psychometric properties that compare favorably with established standards in scale development literature. Confirmatory Factor Analysis (CFA) yielded excellent fit indices: $\chi^2/df=2.782$ (consistent with Kline's [2015] recommendation of <3), RMSEA=.065 (meeting Byrne's [2022] < .08 criterion), CFI=.95, GFI=.927, and TLI=.931, indicating superior model fit (76). These values not only align with typical ranges reported for sports attitude scales (CFI: 0.92-0.98; GFI: 0.89-0.95) (16; 49) but exceed several comparable studies (31; 32). The item loadings (.53-.85) surpass the .50 threshold recommended by Kline (2015) and Hair et al. (2019), while remaining within the typical range for attitude scales (.46-.97) (10). Item correlations (.580-.888) fall within acceptable limits for criterion validity (.40-.90) (86), indicating strong internal consistency. Reliability analysis revealed Cronbach's α coefficients of .814 (cognitive), .755 (affective), and .849 (behavioral) subscales, comparable to other sports attitude measures (25: .78-.93; 36). With a Cronbach's alpha of .902, the scale's reliability surpasses both the typical range for attitude scales .78-.96, (36) and comparable martial arts instruments (40), establishing robust psychometric credentials (10; 42)

Karate Attitude Scale (KAS), Confirmatory Factor Analysis (CFA), fit indices were found to be between CMIN/df: 2.782: RMSEA: .065 AGFI: 0.90 CFI: 0.95: GFI: 0.927: NFI: 0.924: RFI: 0.908: IFI:0.950: TLI: 0.931. Confirmatory Factor Analysis (CFA), item loadings were found to be between .53 and .85 and the scale subfactor was found to be 3 and the number of items was found to be 15. Karate Attitude Scale (KAS), item correlation was found to be between .580 and .888. Cronbach Alpha reliable coefficients were found to be .814 for the cognitive factor, .755 for the affective factor, .849 for the behavioral factor and .925 for the total scale. Karate Attitude Scale (KAS) is compatible with the literature according to all the data obtained. It has higher item fit, correlation and reliability than some studies in the literature.

Karate is a martial art that attracts individuals from all segments of society, regardless of age, and maintains sustained participation. Its inclusion in the 2020 Tokyo Olympic Games significantly increased its global recognition. Although karate has ancient roots, a review of the literature reveals a lack of validated measurement tools designed to assess attitudes toward this discipline.

Furthermore, existing research on karate remains limited in scope. In contrast, numerous attitude scales have been developed for various concepts in sports, education, and other fields. Given this gap, the development of a standardized attitude measurement tool specific to karate is expected to address a critical need in the field.

Karate is a discipline that maintains its traditional values while remaining relevant in the modern world, offering significant contributions to physical health, mental resilience, and social adaptation, particularly in shaping the character development of young individuals. Due to the lack of a validated attitude scale specific to karate, this study aimed to develop a reliable and valid measurement tool, leading to the creation of the Karate Attitude Scale (KAS), intended to contribute to both national and international literature. Prior to its development, a comprehensive review of existing literature was conducted to establish the conceptual framework, and subsequent validation confirmed that the scale possesses a robust, reliable, and highly consistent structure. The scale consists of 15 items divided into three sub-factors: cognitive (items 1-5), affective (items 6-10), and behavioral (items 11-15), with no reverse-scored items. Designed as a 5-point Likert-type scale (1: Strongly Disagree – 5: Strongly Agree), the KAS yields a minimum possible score of 15 and a maximum of 75. It is anticipated that this scale will serve as a valuable tool for researchers investigating attitudes toward karate. Future studies are recommended to reassess the scale's validity and reliability in younger age groups, expand its application across diverse populations, and explore cross-cultural adaptations. Additionally, further research on karate's digital training models and psychological effects is encouraged to deepen the understanding of its broader impact.

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Karate Attitude Scale (KAS) English (Since the original scale was developed in Turkish, these items should be language validated in English before use.)

Karate	e Attitu	ude Scale (KAS) English					
			Strongly Disagree	Disagree	Neutral (or Undecided)	Agree	Strongly Agree
or	1	Karate improves my leadership qualities.	1	2	3	4	5
Fact	2	Karate makes it easier for me to adapt to social life.	1	2	3	4	5
live	3	Thanks to Karate, people care about me.	1	2	3	4	5
gni	4	Karate increases my respect for people.	1	2	3	4	5
č	5	I gain a social circle in karate sports.	1	2	3	4	5
or	6	I would give up most things in my life for karate.	1	2	3	4	5
Fact	7	I am proud to say that I do karate.	1	2	3	4	5
ive	8	Karate contributes positively to my life.	1	2	3	4	5
ffect	9	Topics about karate attract my attention.	1	2	3	4	5
A	10	I like it when people call me "Karate player".	1	2	3	4	5
tor	11	I overcame my fears thanks to karate.	1	2	3	4	5
oral Fact	12	Karate reduces my stress.	1	2	3	4	5
	13	Karate is helpful in correcting my behavior.	1	2	3	4	5
havi	14	My personality develops thanks to karate.	1	2	3	4	5
Bel	15	Karate improves my value judgements.	1	2	3	4	5

Karate	Tutun	n Ölçeği (KATÖ) Türkçe	-	-	-	-	-
			Hiç Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Tamamen Katılıyorum
	1	Karate liderlik özelliğimi geliştirir.	1	2	3	4	5
r el	2	Karate sosyal hayata uyum sağlamamı kolaylaştırır.	1	2	3	4	5
ilişse aktö	3	Karate sayesinde insanlar beni önemser.	1	2	3	4	5
Ю́Ц	4	Karate insanlara saygımı artırır.	1	2	3	4	5
	5	Karate sporunda sosyal çevre kazanırım.	1	2	3	4	5
ör	6	Karate için hayatımdaki çoğu şeyden vazgeçerim.	1	2	3	4	5
Fakt	7	Karate yaptığımı gururla söylerim.	1	2	3	4	5
şsal]	8	Karate hayatıma olumlu katkı yapar.	1	2	3	4	5
iyuş	9	Karate hakkında konular dikkatimi çeker.	1	2	3	4	5
ā	10	İnsanların bana "Karateci" demesi hoşuma gider.	1	2	3	4	5
ctör	11	Karate sayesinde korkularımı yendim.	1	2	3	4	5
ışsal Fak	12	Karate stresimi azaltır.	1	2	3	4	5
	13	Karate davranışlarımı düzeltmemde yararlı olur.	1	2	3	4	5
vran	14	Karate sayesinde kişiliğim gelişir.	1	2	3	4	5
Dav	15	Karate değer yargılarımı geliştirir.	1	2	3	4	5